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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,667	01/18/2002	Jin Qiu	MIT9126	5628

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EXAMINER

VORTMAN, ANATOLY

ART UNIT PAPER NUMBER

2835

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

my

Office Action Summary	Applicati n No.	Applicant(s)	
	10/052,667	QIU ET AL.	
	Examin r	Art Unit	
	Anatoly Vortman	2835	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-20 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8, 11-13, 15, and 18, are rejected under 35 U.S.C. 102(a) as being clearly anticipated by the Applicant's Admitted Prior Art (AAPA).

AAPA teaches (Fig. 1A-2B) a bistable MEMS structure as recited in the claims:

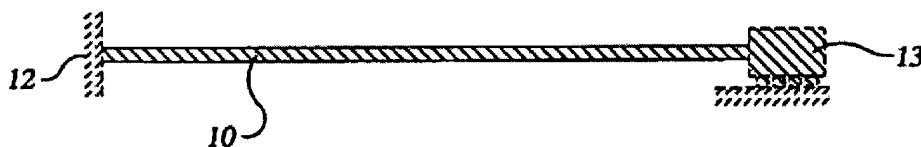
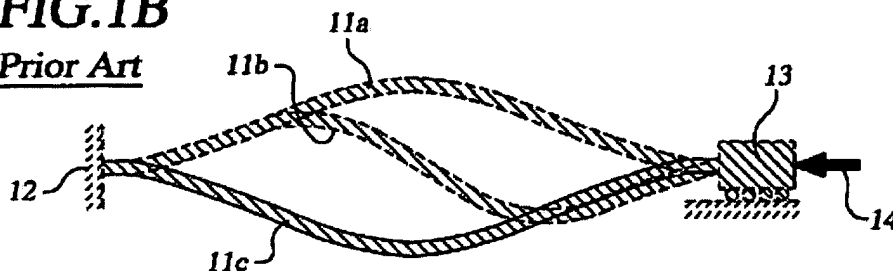
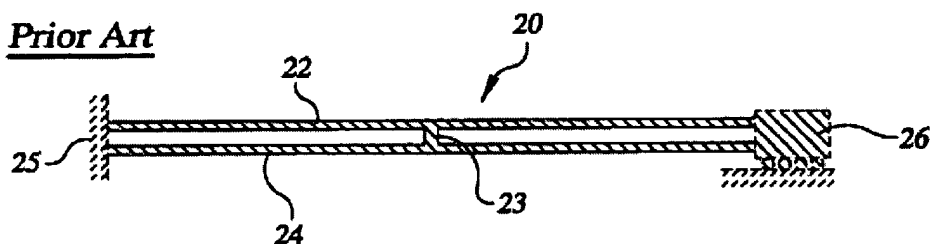
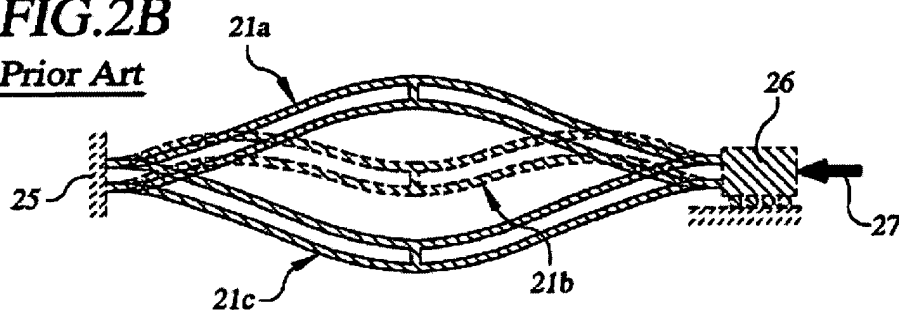
FIG. 1A**Prior Art*****FIG. 1B*****Prior Art**

FIG. 2A**Prior Art****FIG. 2B****Prior Art**

Regarding claims 11 and 12, the claims have not been given patentable weight since they recite the limitations directed to the manufacturing process / apparatus (i.e. lithographic mask) for making the bistable structure.

Even though the claims are limited by and defined by the recited process, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 18, the AAPA bistable structure inherently has a mechanical force applicator, so the structure can move upon application of the force as shown on Fig. 2A and 2B.

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3. Alternatively, claims 1, 2, 4, 5-8, 13, 15, and 18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by US/5,659,171 to Young et al., (Young).

Young disclosed (Fig. 4A, 4B, and 5) a bistable MEMS structure as recited in the claims:

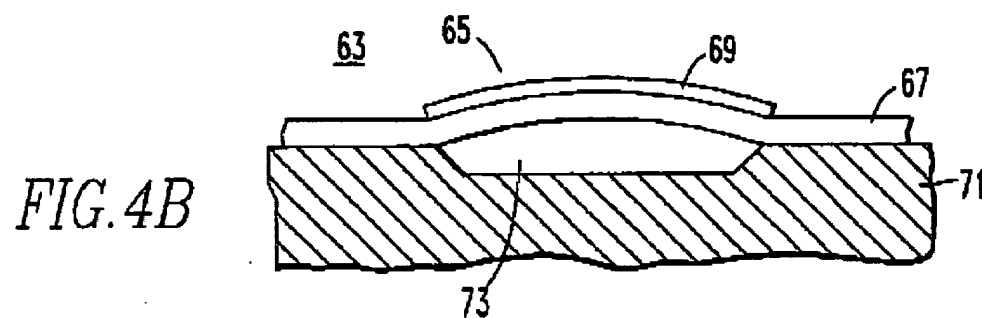
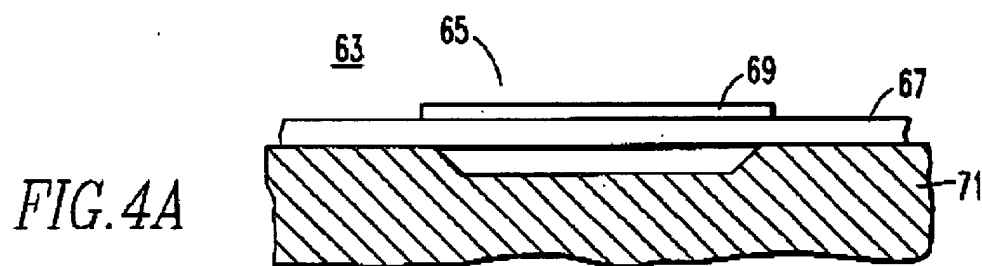
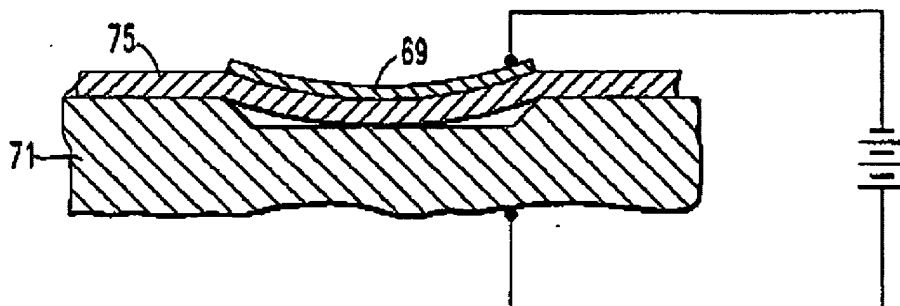


FIG. 5*Claim Rejections - 35 USC § 103*

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over either AAPA or Young.

AAPA or Young disclosed all, but the specific materials (i.e. silicon and aluminum).

Since silicon and aluminum have been notoriously known and widely used in the MEMS art at the time the invention was made, it would have been obvious to a person of ordinary skill in the MEMS art at the time the invention was made to use said silicon and aluminum for making bistable structure as taught by either AAPA or Young, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

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5. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over either AAPA or Young, each taken with US/6,239,685 to Albrecht et al. (Albrecht).

AAPA or Young disclosed all, but electrical contacts contacting with electrically conducting cross bar.

Albrecht teaches MEMS structure (see Fig. 3 below), including electrical contacts (305) electrically contacting the cross bar (304) for providing the structure with switching capabilities (column 7, lines 58+).

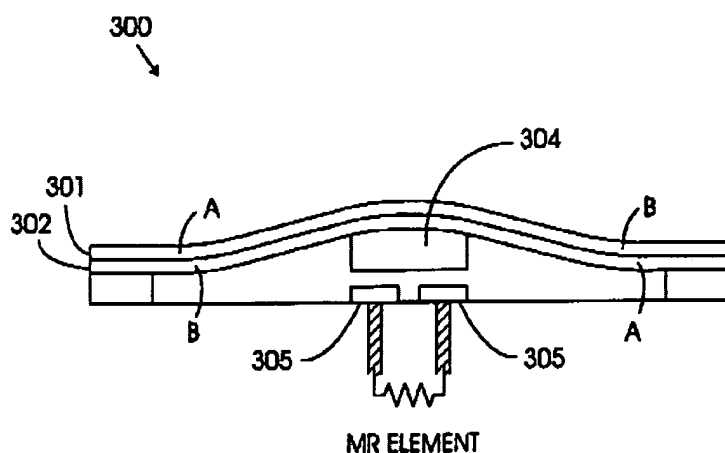


FIG. 3

Since the inventions of AAPA, Young and of Albrecht are from the same field of endeavor (MEMS), the purpose of electrical contacts as taught by Albrecht would be recognized in the inventions of AAPA or of Young.

It would have been obvious to a person of ordinary skill in the MEMS art at the time the invention was made to provide the AAPA or Young devices with electrical contacts as taught by Albrecht in order to employ said devices as electrical switches.

6. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA or Young, each taken with US/5,619,177 to Johnson et al., (Johnson).

AAPA and Young disclosed all, but that the actuation force is thermal or electrostatic.

Johnson disclosed MEMS having both: thermal and electrostatic actuation (Fig. 1A, 1B):

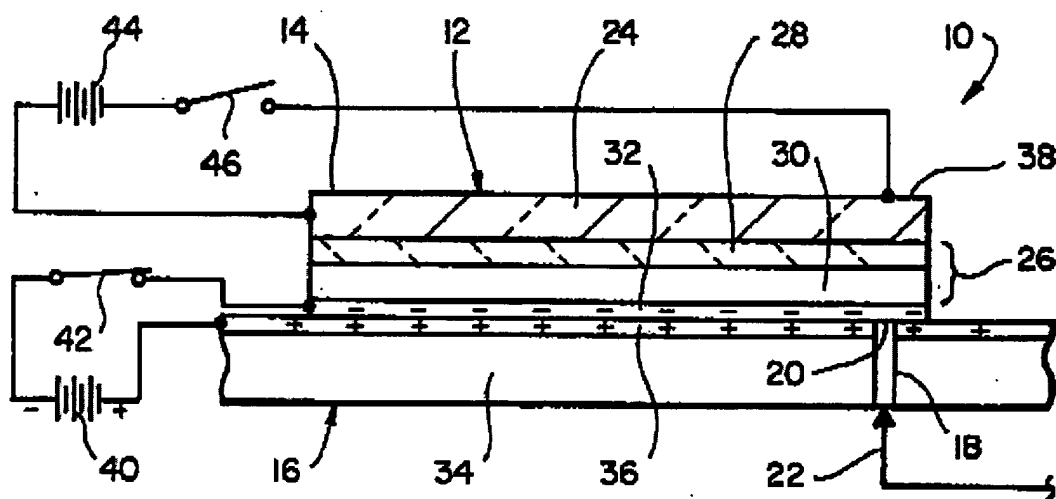
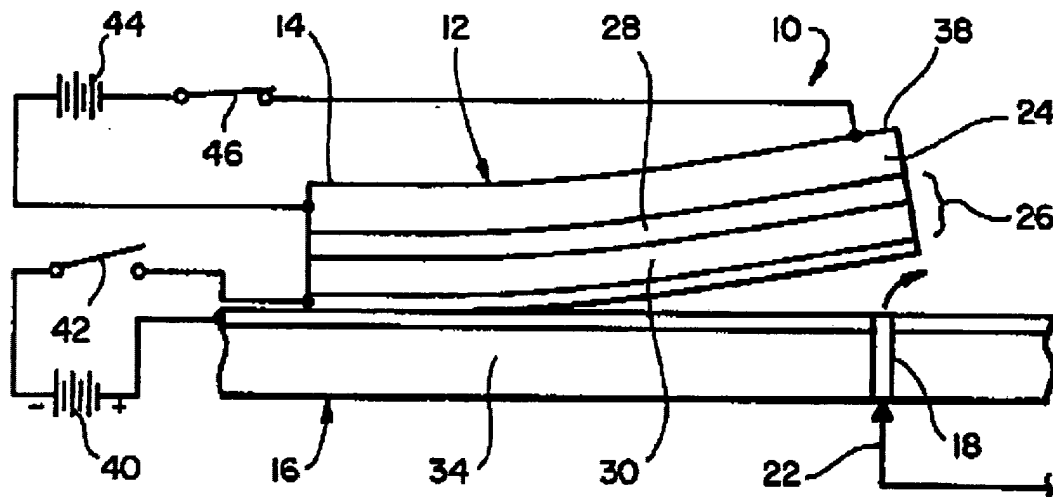


FIG. 1A

**FIG. 1B**

Since inventions of AAPA, Young, and of Johnson are from the same field of endeavor (MEMS), the purpose of the thermal and electrostatic actuation as taught by Johnson would be recognized in the devices of AAPA or of Young.

It would have been obvious to a person of ordinary skill in the MEMS art at the time the invention was made to provide AAPA or Young device with thermal and / or electrostatic actuation as taught by Johnson in order to enhance control characteristics of the AAPA or Young MEMS.

Allowable Subject Matter

7. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:
claim 14 recites:

$$\text{the span length defined as } \frac{\bar{d}(1 - \cos(2\pi x/l))}{2}$$

The aforementioned limitations in combination with all remaining limitations of the claim are believed to render the claim patentable over the art of record.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

US/5619061, 5638946, 5954079, 5984258, 6100477, 6133807, 6188301, 6472962, 6513939, 6691977, 6703916, 2002/0167374, 2003/0006125, 2004/0012062, 5029805, 5058856, 5325880, and 5536963 disclosed MEMS structures with mechanically constrained end portions.

Please note, that all of the aforementioned references would have been also sufficient for rejection under 35 USC 102 of at least independent claim 1.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg can be reached on 571-272-2800, ext 35. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AV

A handwritten signature in black ink, appearing to read 'A. Vortman', followed by a long horizontal flourish line.

Anatoly Vortman
Primary Examiner
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